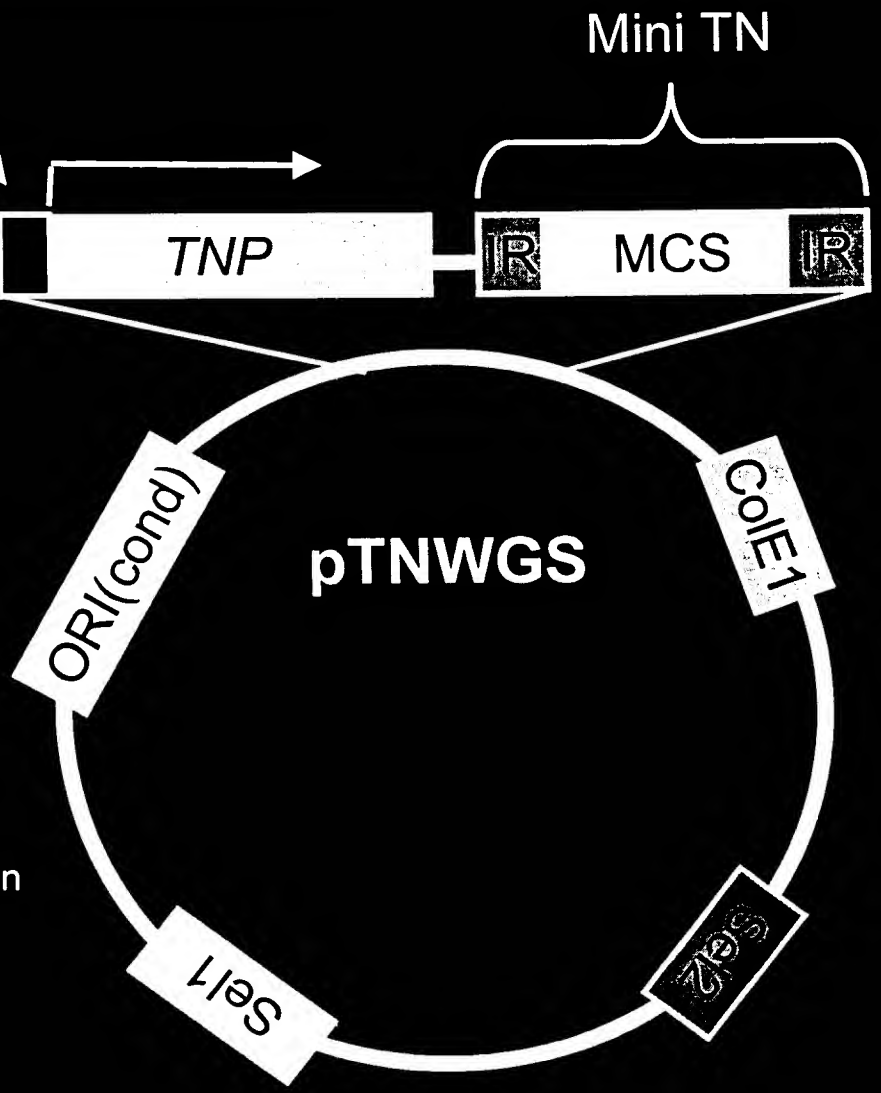
pTNMAX (general vector)

Host specific constitutive promoter

TNP catalyzes the transposition of the mini TN and its contents.

Ori(cond) conditionally replicative origin of replication for target host organism.

Sel1, 2 markers for selection in cloning and target host organism.



Mini-TN inverted repeats from a transposon active in the target host organism.

MCS multiple cloning site for the introduction of gene libraries into the mini IS*S1* transposon.

ORI – origin of replication for the desired cloning host organism.

Figure 1A

pWGS:5

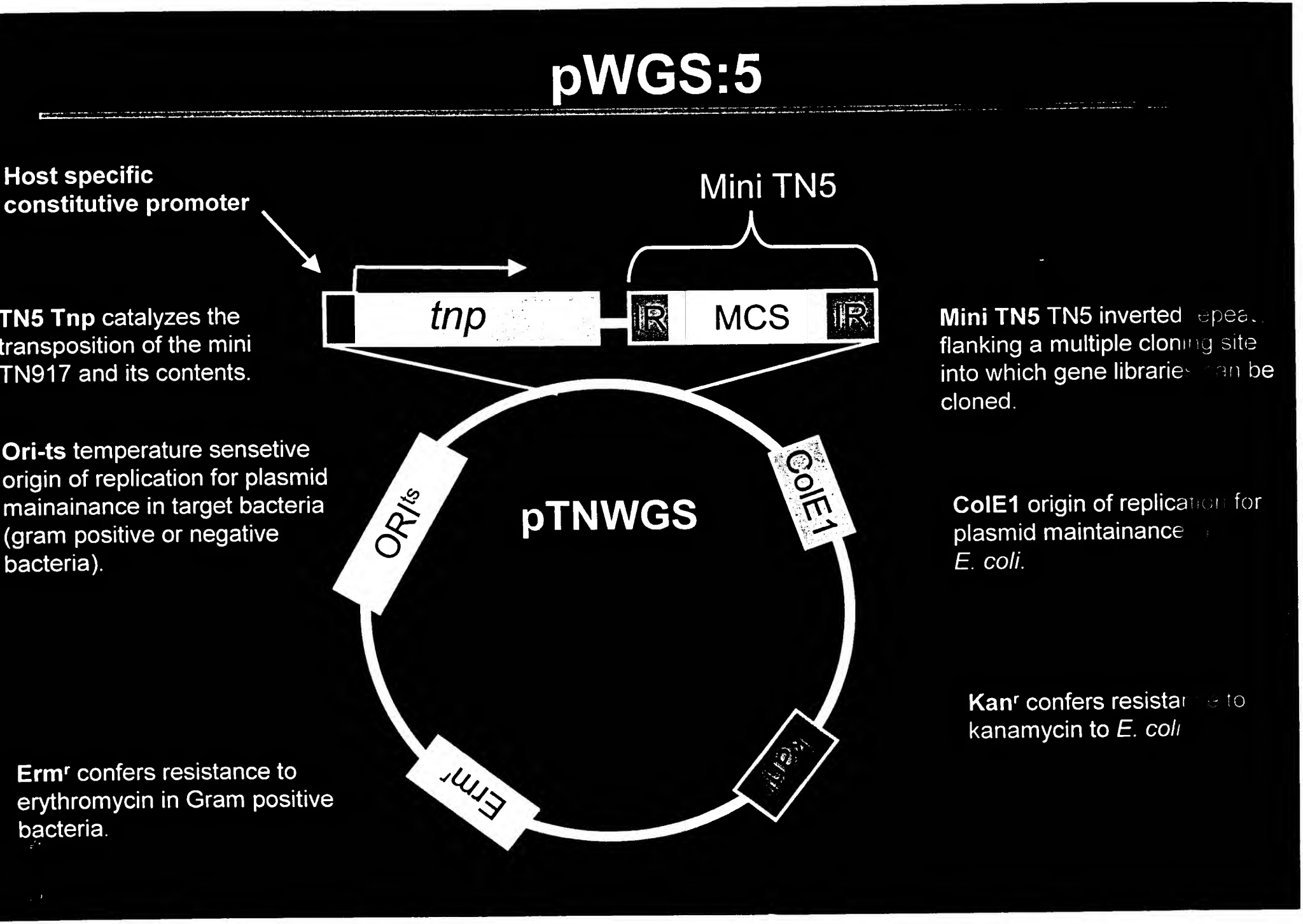


Figure 1B

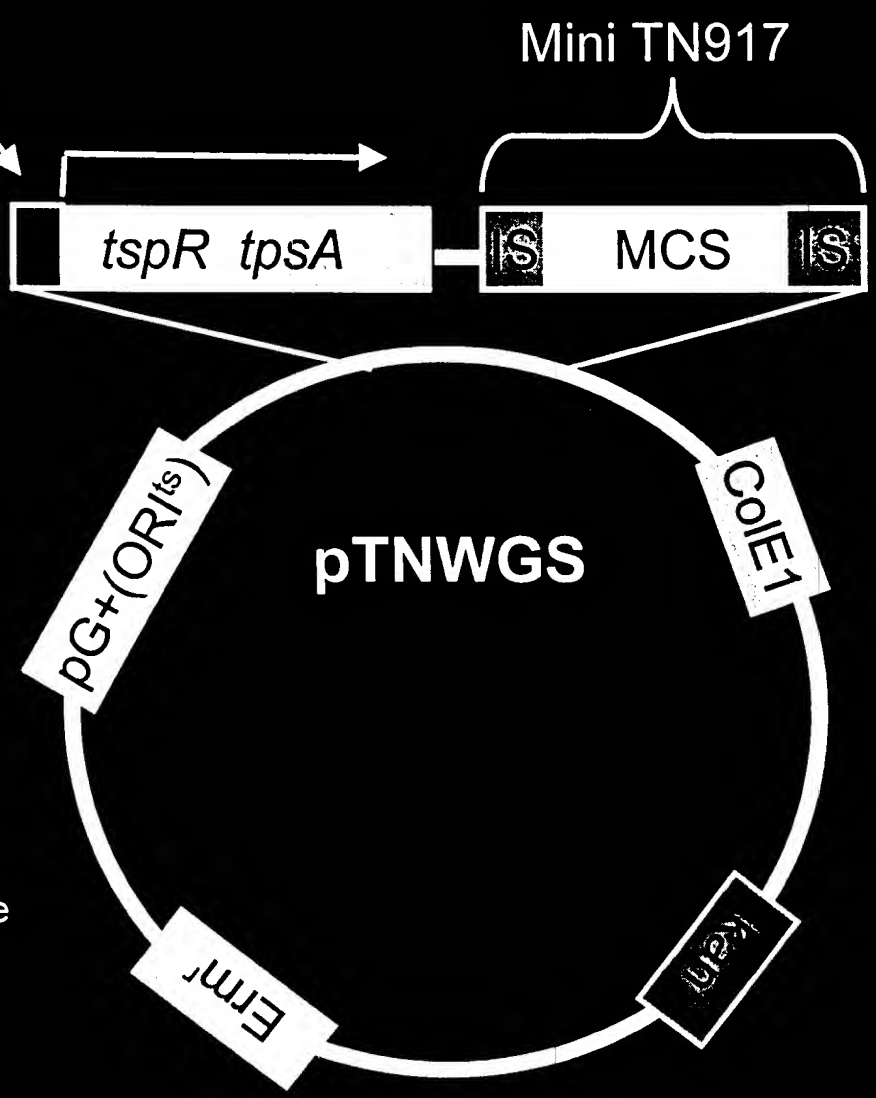
pWGS:917

Host specific promoter – nisA promoter for lactic acid bacteria.

N917 TspR TspA catalyzes e transposition of the mini N917 and its contents ansposase/resolvase)

PG+ temperature sensetive origin of replication for plasmid mainainance in Gram positive bacteria.

Erm^r confers resistance to erythromycin in Gram positive bacteria.



MCS multiple cloning site for the introduction of gene libraries into the mini TN917 transposon.

ColE1 origin of replication for plasmid maintenance in *E. coli*.

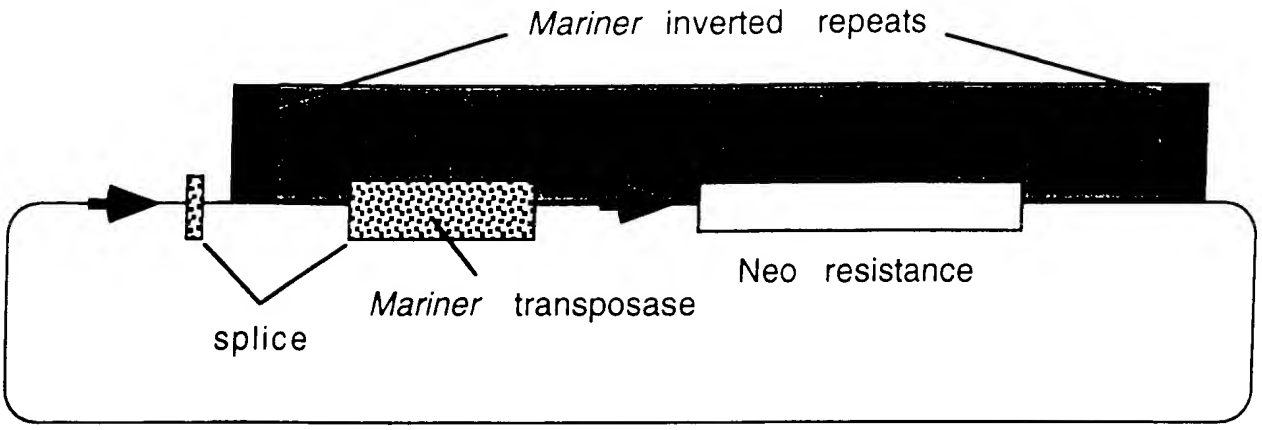
Kan^r confers resistance to kanamycin to *E. coli*.

Figure 1C

Figure 2

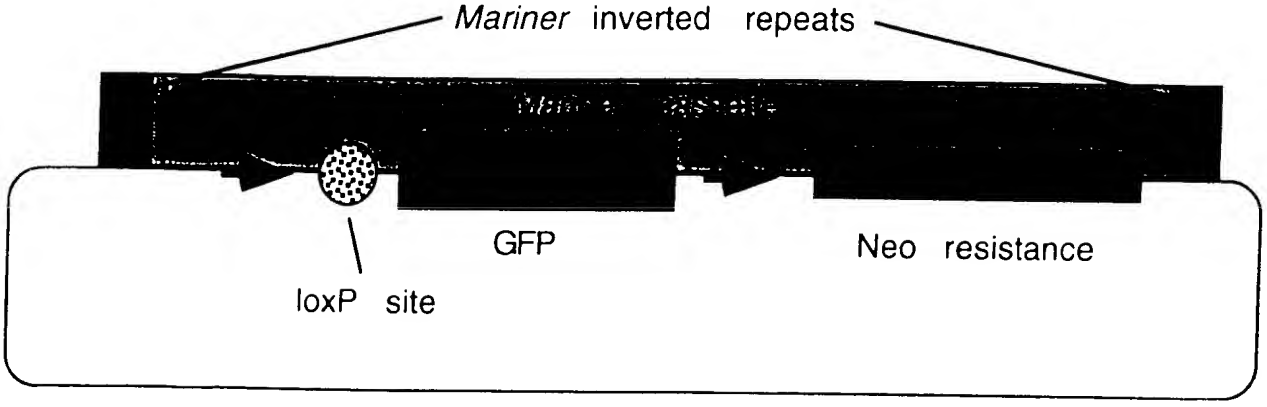
A

Efficient integration into mammalian cells using evolved *Mariner* transposons



B

***Mariner* transposon for inserting loxP sites at loci with desirable expression properties**



Methodology for Isolating Hosts with improved Phenotypes by Whole Genome Shuffling (WGS)

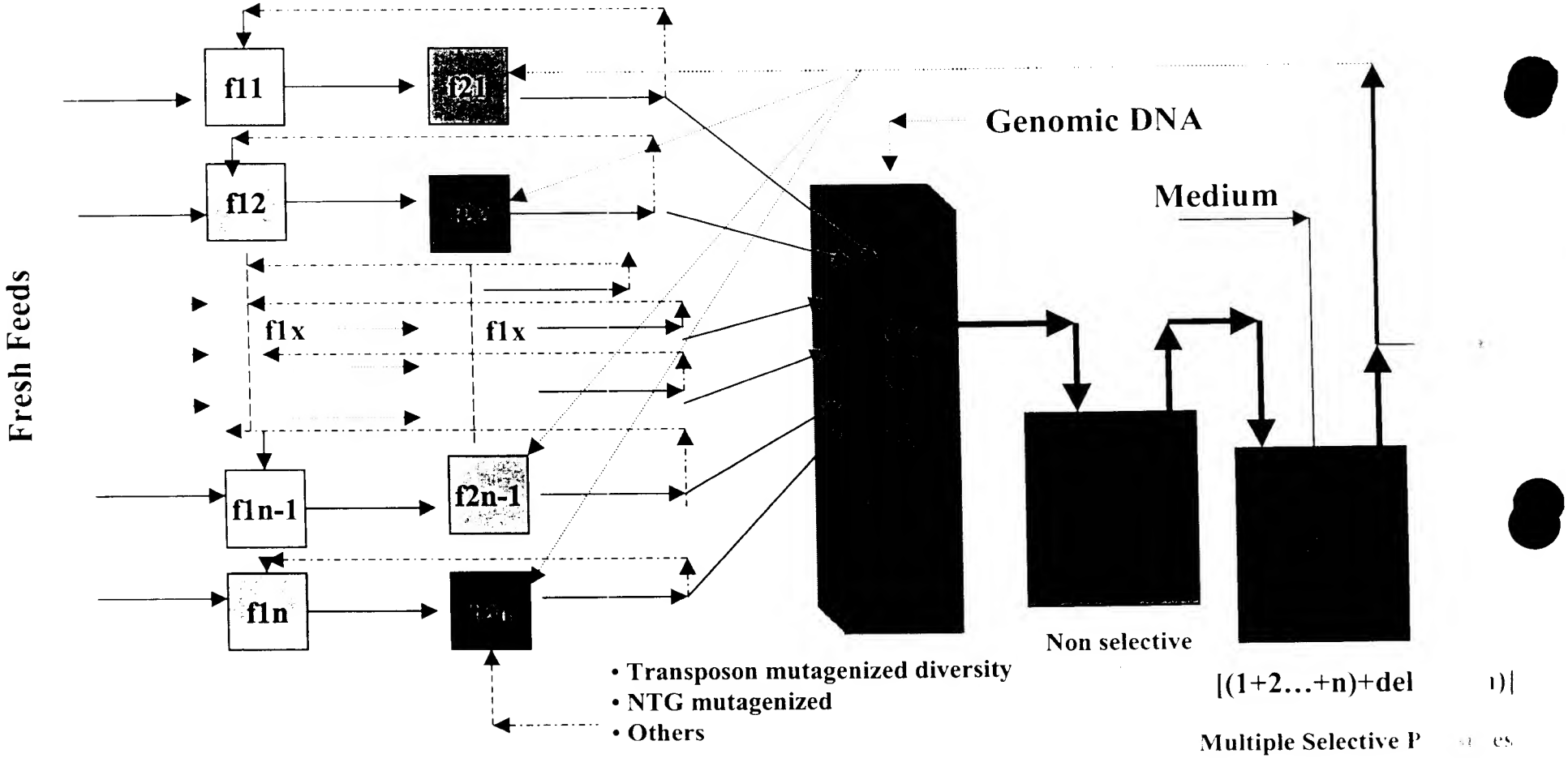


Figure 3

Shuffling of Genomes *In Vitro:*
Formation of transposomes

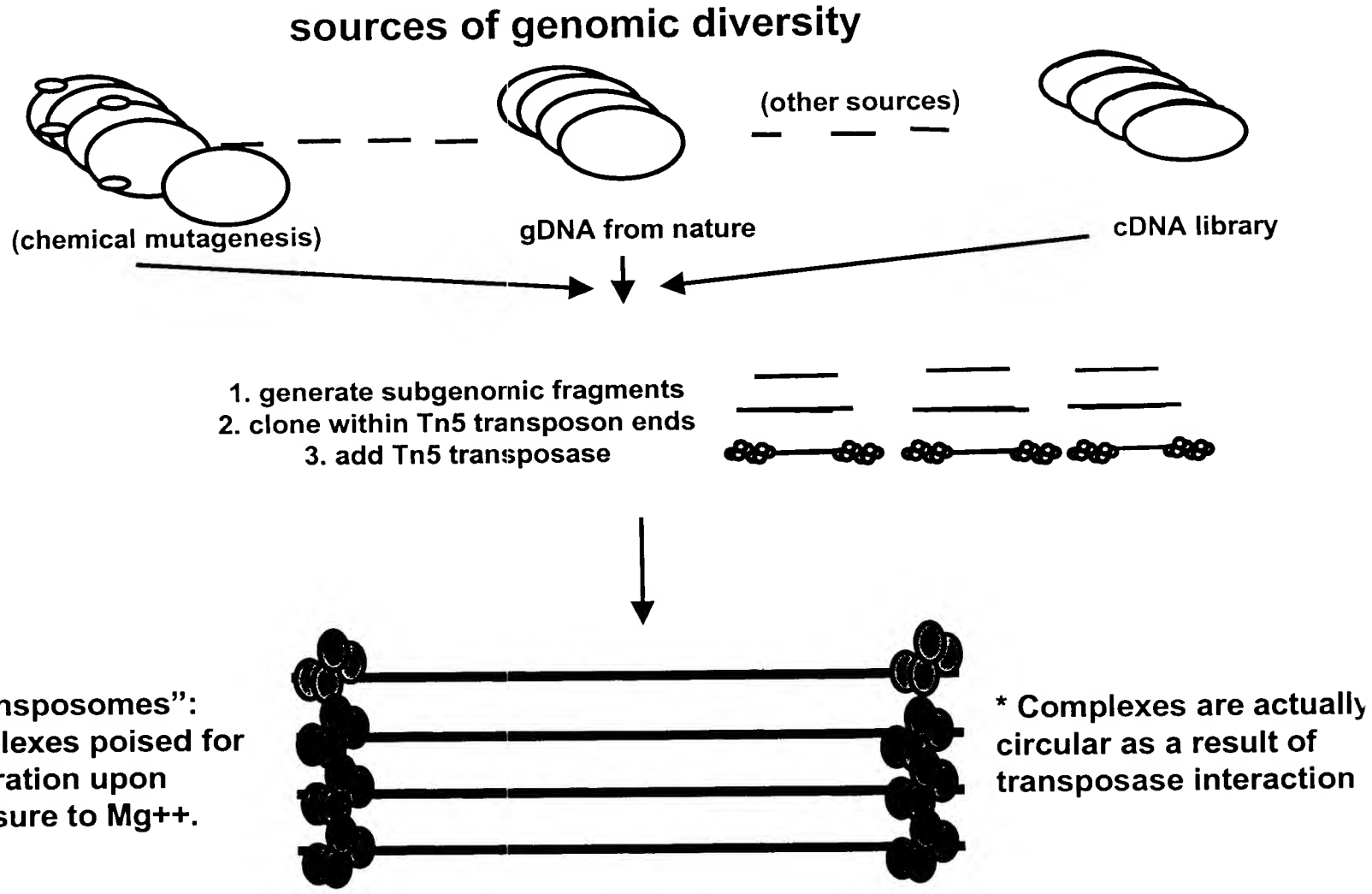


Figure 4A

Shuffling of Genomes *In Vitro:*
Breeding multiple donor genomes with a single acceptor genome

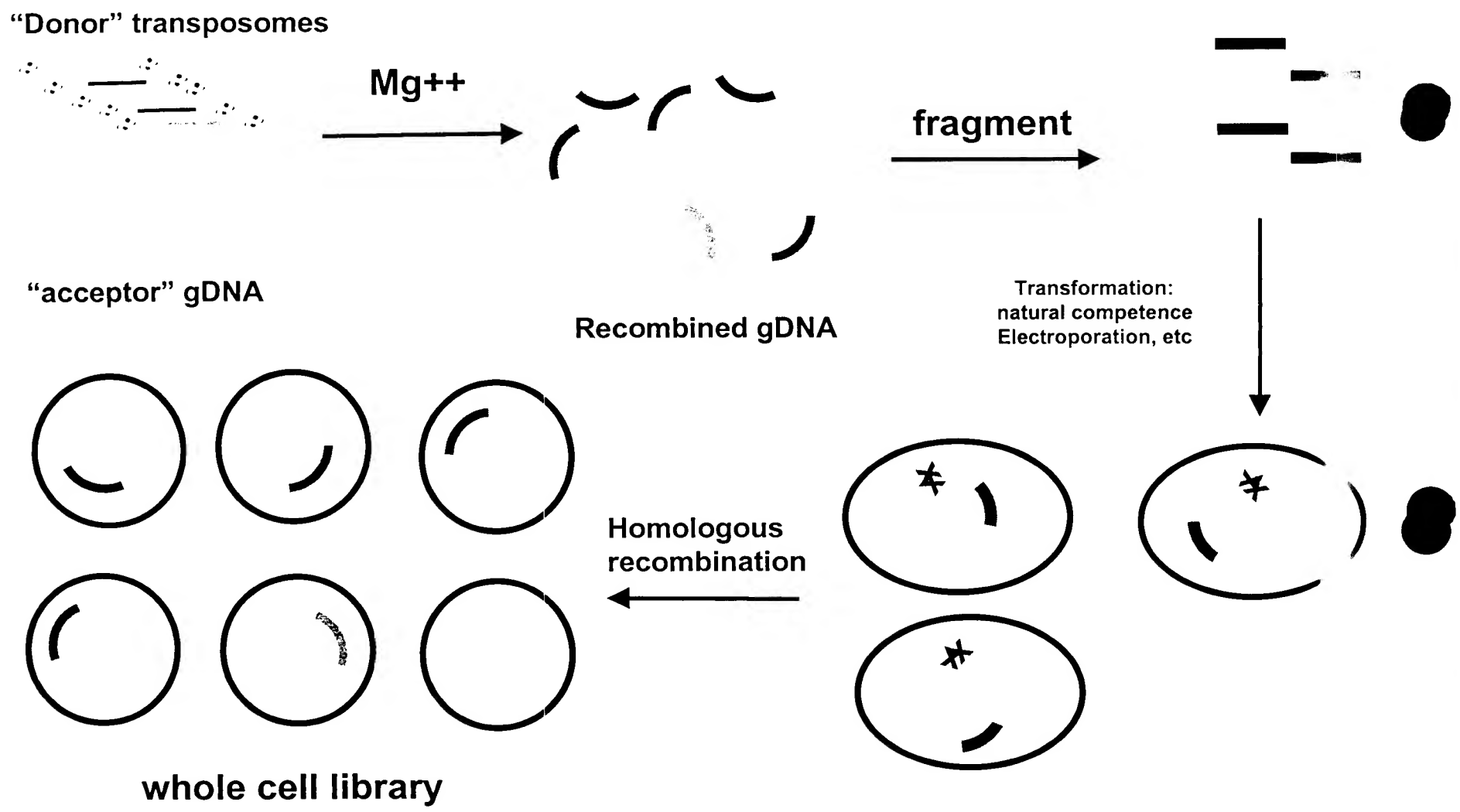


Figure 4B

Shuffling of Genomes *In Vitro:*
Breeding multiple donor genomes with multiple acceptor genomes

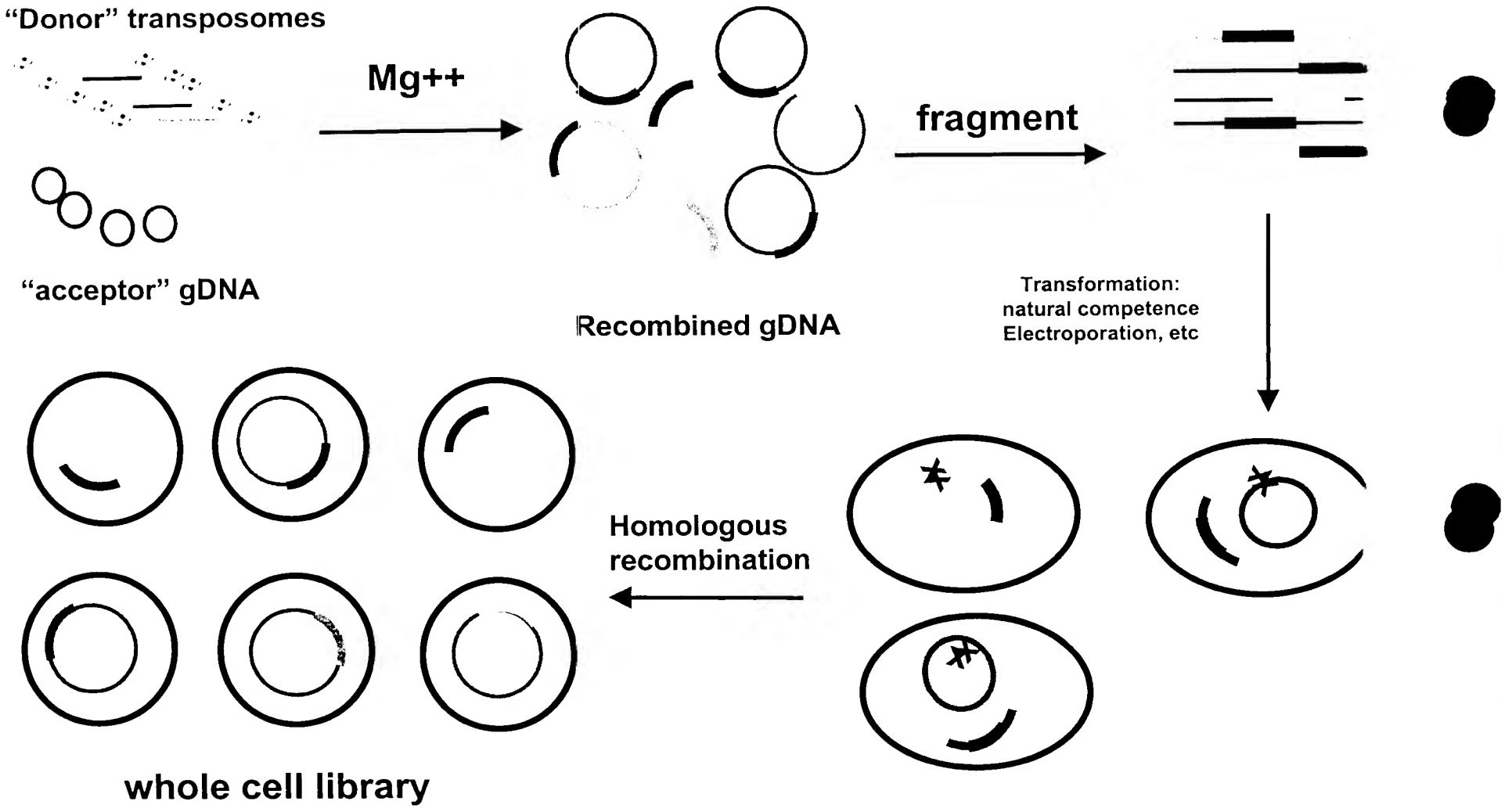


Figure 4C

Shuffling of Genomes *In Vitro:*
Split pool recursive *in vitro* recombination of multiple genomes

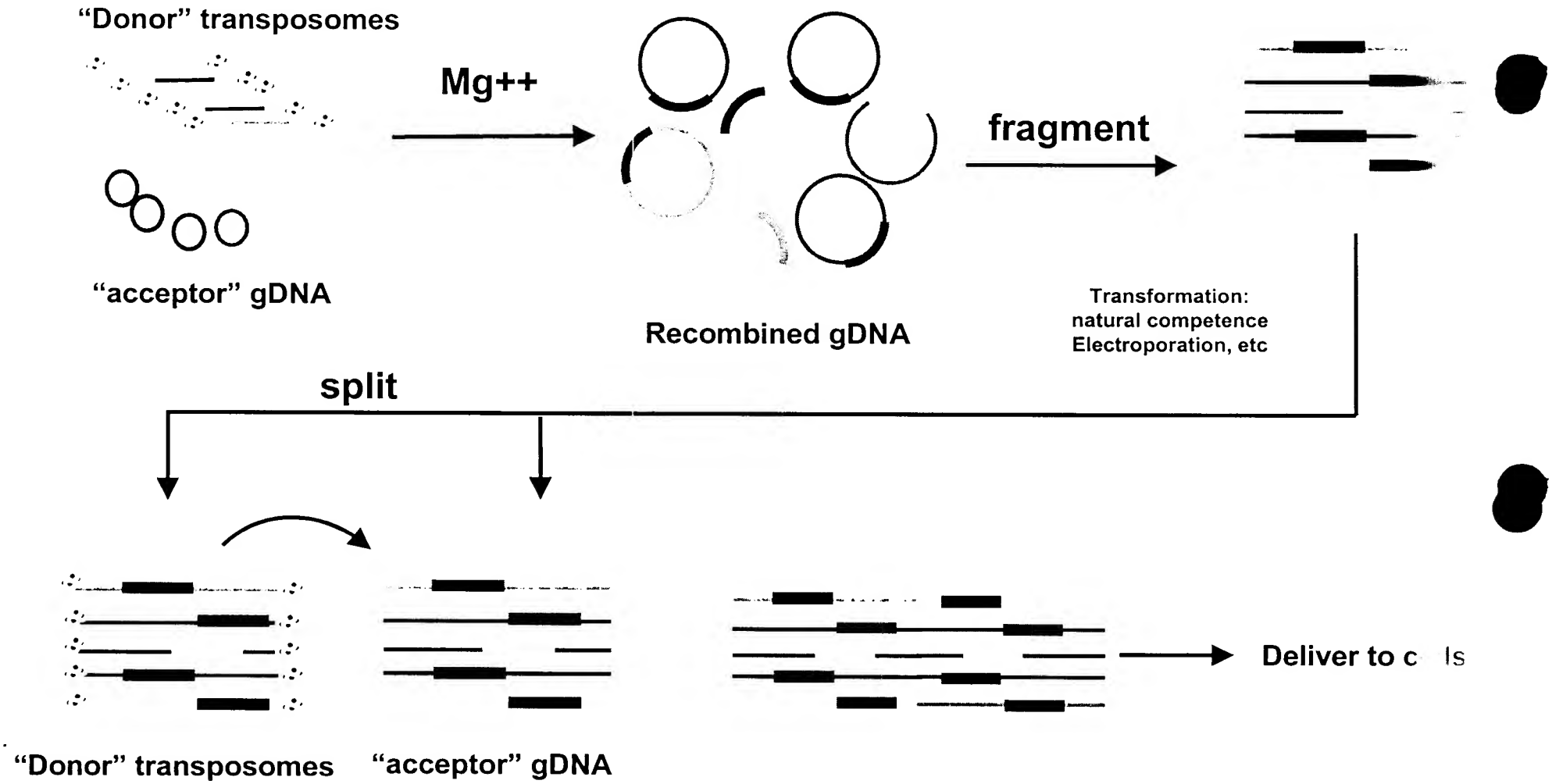


Figure 4D